REMARKS / ARGUMENTS

Status of Claims

Claims 1-7 and 9-17 are pending in the application and stand rejected. Applicant has amended Claims 1, 6, 13, 14, and 17, and added Claim 18, leaving Claims 1-7 and 9-18 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

Rejections Under 35 U.S.C. §102(b)

Claims 14-16 stand rejected under 35 U.S.C. §102(b) as being anticipated by Sugimoto (U.S. Patent No. 4,785,246, hereinafter Sugimoto).

Applicant traverses this rejection for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, ***in a single prior art reference***." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the *** claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "***arranged as in the claim***." Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984) (emphasis added). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Applicant has amended Claim 14 to now recite, inter alia,

"...an RF shield disposed for shielding the gradient field generating means, the shield comprising a cylindrically arranged conductive sheet having first and second ends,

and a plurality of sets of discontinuous slots disposed about the cylindrical sheet and running between the first and second ends;

wherein the RF field generating means and the RF shield are configured to have a ***desired Q-factor*** equal to or greater than a defined threshold Q-factor, the defined threshold Q-factor being defined as 50% of the Q-factor that the RF field generating means and the RF shield would provide as a result of the RF shield being made from a sheet of solid copper having a thickness of about three times the skin depth at a frequency of about 64 MegaHertz; and

wherein the RF shield and the gradient field generating means are capable of providing the desired Q-factor in response to the RF shield being configured by arranging a single sheet of the conductive sheet into the cylindrically arranged conductive sheet with a single seam running lengthwise between the first and second ends."

No new matter has been added as antecedent support may be found in the application as originally filed, such as in the originally filed claims, Paragraphs [0017-0020] and [0028], and Figures 2, 3 and 6, for example.

Dependent claims inherit all of the limitations of the respective parent claim.

In comparing Sugimoto with the claimed invention as amended, Applicant finds Sugimoto to disclose a "substantially cylindrical body 45" (Figure 7; col. 4, lines 1-2) with "slits formed along the central axis of body 45, extending from one end of body 45 ***close to the other end***" (Figure 7; col. 4, lines 8-10) (emphasis added). Since Sugimoto discloses slits extending ***close to the other end***, Applicant finds Sugimoto to be absent disclosure of a single sheet with ***a single seam running lengthwise between the first and second ends.***

In further comparing Sugimoto with the claimed invention as amended, Applicant finds Sugimoto to disclose "that ***four sheets*** of copper foil 52 are coupled in the form of a cylinder, with their ends successively overlapping one another" (Figure 8; col. 4, lines 44-45). Since Sugimoto discloses ***four sheets*** of copper foil, Applicant finds Sugimoto to be

absent disclosure of ***a single sheet with a single seam*** running lengthwise between the first and second ends.

In view of the foregoing, Applicant finds Sugimoto to be absent disclosure of each and every element of the claimed invention arranged as claimed. More specifically, Applicant finds Sugimoto to the absent disclosure of

"***...wherein the RF shield and the gradient field generating means are capable of providing the desired Q-factor in response to the RF shield being configured by arranging a single sheet of the conductive sheet into the cylindrically arranged conductive sheet with a single seam running lengthwise between the first and second ends.***"

Absent anticipatory disclosure of each and every element of the claimed invention arranged as claimed, Sugimoto cannot be anticipatory.

In view of the amendment and foregoing remarks, Applicant submits that Sugimoto does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

Rejections Under 35 U.S.C. §103(a)

Claims 1-7 and 9-16 are rejected under 35 U.S.C. §103(a) as being unpatentable by Richard et al. (U.S. Patent Number 5,592,087 hereinafter Richard) in view of Frederick (U.S. Patent No. 5,367,261, hereinafter Frederick), de Swiet et al. (U.S. Patent Publication No. 2004/0113617 hereinafter de Swiet), Morich et al. (U.S. Patent Number 5,406,204 hereinafter Morich), Hayes et al. (U.S. Patent Number 4,642,569 hereinafter Hayes), and Sugimoto.

Claim 1 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard.

Claims 14-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Richard.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard.

Claims 2 and 3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Frederick.

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of de Swiet.

Claims 6-7 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Morich.

Claim 10 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Morich, and futher in view of Frederick.

Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Hayes.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard.

Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Sugimoto.

Claim 17 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Richard in view of Morich and further in view of Sugimoto.

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest ***each and every element of the instant invention arranged in such a manner as to perform as the claimed invention performs.*** For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

Regarding Claims 1, 14 and 17

Claims 1, 14 and 17 are independent claims, which have been amended to now recite, inter alia:

"...wherein the RF shield and coil are ***capable of providing the desired Q-factor in response to the RF shield being configured by arranging a single sheet of the conductive sheet into the cylindrically arranged conductive sheet with a single seam running between the first and second ends.***" (Claim 1);

"...wherein the RF shield and the gradient field generating means are ***capable of providing the desired Q-factor in response to the RF shield being configured by arranging a single sheet of the conductive sheet into the cylindrically arranged conductive sheet with a single seam running lengthwise between the first and second ends.***" (Claim 14); and

"...***a single cylindrically arranged copper alloy mesh sheet having a single overlap seam***..." (Claim 17).

No new matter has been added as antecedent support may be found in the application as originally filed, such as at Paragraphs [0017-0020] and [0028], and Figures 2, 3 and 6, for example.

Dependent claims inherit all of the limitations of the respective parent claim.

Here, Applicant claims a RF shield configured by arranging a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam, and being capable in that configuration of providing the desired (and claimed) Q-factor.

For an obviousnesss rejection to stand, it is not enough to allege a teaching or suggestion of each and every element, in combination with a teaching of the resultant desired Q-factor, but rather it is necessary to show where the references teach or suggest ***each and every element of the claimed invention arranged so as to perform as the claimed invention performs***, and motivate one skilled in the art to make such a combination. Applicant respectfully submits that this burden has not been met by the combination of References cited by the Examiner.

Regarding Richard

In comparing Richard with the claimed invention, Applicant finds Richard to be absent a teaching or suggestion of a RF shield configured by arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single***

seam, and being capable in that configuration of providing the desired (and claimed) Q-factor.

More specifically, Applicant finds Richard to disclose "The radio frequency shield 60 in the preferred embodiment, is a ***double-sided*** circuit board which includes ***a central dielectric layer 62*** which has ***layers of metal, preferably copper, foil 64, 66 adhered to opposite sides***." (Figure 3; col. 4, lines 24-27).

Here, Applicant finds Richard to teach or suggest at least a two-layer shield arrangement, not a single cylindrically arranged conductive sheet having only a single seam that is capable of providing the desired (and claimed) Q-factor.

Accordingly, Applicant finds Richard to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

Regarding Frederick

In comparing Frederick with the claimed invention, Applicant finds Frederick to be absent a teaching or suggestion of a RF shield configured by arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam***, and being capable in that configuration of providing the desired (and claimed) Q-factor.

More specifically, Applicant finds Frederick to disclose "The shield (170) for a full body coil is fabricated by ***applying two conductive patterns 180 and 182 on opposite major surfaces 165 and 167 of a tube 169*** formed of dielectric material." (Figures 4A and 4B; col. 6, lines 51-55).

Here, Applicant finds Frederick to teach or suggest at least a two-layer shield arrangement, not a single cylindrically arranged conductive sheet having only a single seam that is capable of providing the desired (and claimed) Q-factor.

Accordingly, Applicant finds Frederick to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

Regarding de Swiet

In comparing de Swiet with the claimed invention, Applicant finds de Swiet to be absent a teaching or suggestion of a RF shield configured by arranging ***a single***

conductive sheet into a cylindrically arranged conductive sheet having only a single seam, and being capable in that configuration of providing the desired (and claimed) Q-factor.

More specifically, Applicant finds de Swiet to disclose "The shield structure 14 may be briefly described as ***a pair*** of slotted rings symmetrically ***aligned with windows 18 and 19***". (Figures 2a and 2b; Paragraph [0019], lines 22-23).

Here, Applicant finds de Swiet to teach or suggest at least a two-ring shield arrangement, not a single cylindrically arranged conductive sheet having only a single seam that is capable of providing the desired (and claimed) Q-factor.

Accordingly, Applicant finds de Swiet to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

Regarding Morich

In comparing Morich with the claimed invention, Applicant finds Morich to be absent a teaching or suggestion of a RF shield configured by arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam***, and being capable in that configuration of providing the desired (and claimed) Q-factor.

More specifically, Applicant finds Morich to disclose "The RF shield, preferably overlapped and insulated ***strips*** of copper foil or fine copper mesh, is applied to the outer surface of the former 46 and through the z-coil receiving grooves 48." (Figure 2; col. 5, lines 27-30).

Here, Applicant finds Morich to teach or suggest a shield arrangement made of a plurality of strips applied to the outer surface of a former, not a single cylindrically arranged conductive sheet having only a single seam that is capable of providing the desired (and claimed) Q-factor.

Accordingly, Applicant finds Morich to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

Regarding Hayes

In comparing Hayes with the claimed invention, Applicant finds Hayes to be absent a teaching or suggestion of a RF shield configured by arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam***, and being capable in that configuration of providing the desired (and claimed) Q-factor.

More specifically, Applicant finds Hayes to disclose "a decoupling RF shield... with reference to Figure 2... is made up of ***two sheets 32 and 34*** of a conductive material, such as copper, separated by a thin layer 36 of a low-loss flexible dielectric material". (Figure 2; col. 3, lines 37-42). Also, Applicant finds Hayes to disclose "a decoupling shield... is depicted in Figure 6... the etched pattern to be used on the ***two conductive surfaces separated by the dielectric material.***" (Figure 6; col. 6, lines 4-8).

Here, Applicant finds Hayes to teach or suggest at least a two-layer shield arrangement, not a single cylindrically arranged conductive sheet having only a single seam that is capable of providing the desired (and claimed) Q-factor.

Accordingly, Applicant finds Hayes to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

Regarding Sugimoto

Applicant has set forth above in the section relating to the Rejections Under 35 U.S.C. §102(b), remarks that support Applicants finding that Sugimoto is absent a teaching or suggestion of a RF shield configured by arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam***, and being capable in that configuration of providing the desired (and claimed) Q-factor. Such remarks are not repeated here, but are otherwise incorporated herein by reference.

Accordingly, Applicant finds Sugimoto to be deficient in teaching or suggesting the noted claim element of Claims 1, 14 and 17.

In Summary

In comparing Richard, Frederick, de Swiet, Morich, Hayes, and Sugimoto, in the combinations set forth by the Examiner, with the instant invention, Applicant finds each such combination to be absent a teaching or suggestion of a RF shield configured by

arranging ***a single conductive sheet into a cylindrically arranged conductive sheet having only a single seam***, and being capable in that configuration of providing the desired (and claimed) Q-factor.

Accordingly, and in view of the foregoing, Applicant submits that the references are absent a teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

Regarding Claims 6, 13 and 17 More Specifically

Applicant has amended Claims 6, 13 and 17, to now recited, inter alia;

"...in response to the seam having an overlap with a dielectric between the overlapped sections, the RF coil has a Z-gradient coil with a first resistance characteristic that is less than a second resistance characteristic that the Z-gradient coil would have as a result of the seam being electrically joined absent a dielectric overlap, the first resistance characteristic being less than the second resistance characteristic over a frequency range from 2kHz to 50kHz." (Claim 6);

"...in response to the integrally formed capacitor, the RF coil has a Z-gradient coil with a first resistance characteristic that is less than a second resistance characteristic that the Z-gradient coil would have as a result of the seam being electrically joined absent a dielectric overlap, the first resistance characteristic being less than the second resistance characteristic over a frequency range from 2kHz to 50kHz." (Claim 13); and

"...wherein in response to the integrally formed capacitor at the overlap seam, the RF coil has a Z-gradient coil with a first resistance characteristic that is less than a second resistance characteristic that the Z-gradient coil would have as a result of the seam being electrically joined absent a dielectric overlap, the first resistance characteristic being less than the second resistance characteristic over a frequency range from 2kHz to 50kHz; and

wherein the first resistance characteristic is 1/3 the second characteristic at 10kHz." (Claim 17).

No new matter has been added as antecedent support may be found in the application as originally filed, such as at Paragraph [0026] and Figure 7, for example.

Dependent claims inherit all of the limitations of the respective parent claim.

Here, Applicant describes, illustrates and claims, a coil and RF shield arrangement unexpectedly having an advantageously lower resistance characteristic over a defined frequency range from 2kHz to 50kHz, and a substantially lower resistance characteristic at 10kHz (Claim 17), as compared to other coil and RF shield arrangements. Only through the teaching of the instant application would one skilled in the art be apprised of this unexpected advantage.

While the Examiner alleges that "the RF shield described by the above combination of references ***should*** provide substantially the same results as does Applicant's in terms of quality factor", and that "it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the 'optimum range' involves only routine skill in the art" (Paper No. 20051130, page 8), the Examiner has not shown with specificity how the combination of references ***necessarily arrive at*** the claimed unexpected advantage. Also, the Examiner merely states that the "references ***should*** provide substantially the same results", not that the references ***necessarily will provide*** substantially the same results. Accordingly, Applicant finds that the references are deficient in teaching or suggesting each and every element of the claimed invention arranged so as to necessarily perform as the claimed invention performs.

Furthermore, and as the Examiner states, the discovery of an optimum range first requires that the prior art references disclose the general conditions of the claimed invention. As set forth above, Applicant submits that the combination of references cited by the Examiner fall wholly short of teaching each and every element of the claimed invention, and therefore absolutely do not meet the requirement of the prior art references disclosing the general condition of the claimed invention.

In view of the foregoing, Applicant submits that the references are absent a teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs and therefore cannot properly be used to

establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

Regarding New Claim 18

Applicant has added new Claim 18, which depends from Claim 1 through Claim 6, to capture disclosed but previously unclaimed subject matter. No new matter has been added as antecedent support may be found in the application as originally filed, such as at Paragraph [0026] and Figure 7, for example.

In view of the remarks set forth above regarding the allowability of Claims 1 and 6, Applicant submits that Claim 18 is allowable, and respectfully requests entry and notice of allowance thereof.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

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